

# Addendum: Enhanced Environmental Water Delivery

## 1. Summary of project and key elements

This business case describes the Enhanced Environmental Water Delivery proposal for the Sustainable Diversion Limit (SDL) adjustment mechanism. The Enhanced Environmental Water Delivery proposal achieves environmental outcomes while using less water in the SDL adjustment modelling framework.

The Enhanced Environmental Water Delivery proposal is a water delivery strategy with a focus on provision of moderate to higher flow regimes, coordination of environmental water releases across tributaries of the southern basin, targeted water delivery where required to achieve outcomes and enabling the efficient provision of overbank flows to utilise the opportunities provided by the Constraints easing projects.

As outlined in the business case key elements include:

1. Aligning the release of held environmental water with unregulated flows to shape the peak and or duration of a flow event, in order to create a stronger biological stimulus in synch with natural climate signals.
2. Making efficient use of channel capacity through the implementation of Constraints Measures to allow increased managed flows up to higher regulated limits in order to improve in-channel, floodplain and wetland outcomes and may improve end of system outcomes.
3. Coordinating environmental water releases across tributaries of the southern basin to maximise downstream and system-wide connectivity outcomes.

The proposal is a step change in river management and requires an unprecedented level of planning, forecasting, coordination and operations across the main River stem and tributaries – that is a scale not previously contemplated. Rather than an evolution of changes over 15-20 years the proposal seeks to progress this step change in 6 years to 2024. This is compressing a significant amount of work into a relatively short project implementation period and this cannot be done relying on business as usual processes.

This requires:

- Accurately aligning the release of held environmental water with unregulated flows to shape the peak and/or duration of a flow event, in order to create a stronger biological stimulus in synch with natural climate signals. This provides opportunities to create desired flow regimes using smaller volumes of held water than would otherwise be possible if releases were not well aligned with natural inflow events.
- Making decisions to release water quickly, to enable a timely response to a natural flow event in real time.
- Making efficient use of channel capacity through the implementation of Constraint Measures to allow higher managed flows up to new regulated limits in order to improve in-channel, floodplain and wetland outcomes and may improve end of system outcomes.
- Coordinating environmental water releases across tributaries of the southern basin to maximise downstream and system-wide connectivity outcomes with efficient use of environmental water.
- Targeting water releases where required to achieve outcomes recognising it is no longer a natural system.

- Integration with other environmental watering approaches.

To achieve a supply offset, the project relies largely on achieving a good alignment of regulated releases with unregulated flow events, thus reducing the total release volume required. This approach needs to be able to integrate with and complement other environmental watering approaches. This involves a significant change from historic and current water management.

Particular challenges include understanding ecological outcomes that can be targeted and relating these to hydrology; significantly improved river flow prediction and management under unregulated flow conditions; determining which events in which years to target, better understanding of river flow behaviour across floodplains (and how it affects downstream river flows), and in particular timing of releases from multiple sources over large distances (with differing flow travel times) in response to changing unregulated flows.

Releases will be made on a probabilistic basis (considering likely coming weather and flow conditions). This will require detailed statistical analysis of historic inflow data to determine the most likely periods when target events for supplementation may occur. This analysis will also identify the correlation between various types of early season events and the likelihood of subsequent target events for supplementation. This will enable a range of trigger criteria to be identified and used in conjunction with the enhanced flow forecasting tools that will be developed through the project, to identify when managed releases should commence to supplement potential unregulated flows and how these releases relate to other watering events

The other important challenge that this project will address is developing the criteria that can be used to make decisions about when during any season to cease or curtail efforts to supplement natural events, as the probabilities of success are below acceptable risk thresholds. These decision support tools will be used to trigger a switch to alternate environmental water priorities and techniques, including targeted delivery to key environmental assets. This is one of the challenges for this project – integrating the hydro cues techniques with other existing e-water delivery approaches to develop a flexible set of tools to take advantage of the widest possible range of seasonal conditions and opportunities. Flow forecasting and decision support will need to relate to all types of watering events over varying spatial and temporal scales. The scale will be over years not just on an annual basis so that past watering events and outcomes and future planned events can be taken into account.

Hence, a significant knowledge base is required to understand the chances of success and risks of adverse outcomes. This project needs to build this knowledge base and associated tools to guide decision making. It also needs to be implemented under an adaptive management framework where the knowledge base and systems are continuously improved to increase the probability of successful outcomes with the lowest possible water use. Hence the inclusion of trials, monitoring and evaluation during the implementation of the project to 2024.

Critically, alignment of flow release decisions with rapid changing unregulated river flows requires much faster and clearer decision making structures and processes than have been required in the past. Otherwise, release decisions will lag the unregulated flow events and not achieve the water release efficiency required to deliver the SDL offset. To develop and implement these structures requires substantial work in a relatively short project implementation period.

Another challenge for the project will be the level of engagement and consultation required across the numerous environmental water holders, environmental water planners and managers and river operators, among others, to develop and implement the proposal. This will in effect be a significant

change management process requiring new approaches to environmental water planning and delivery. At the end of the day the project will only be successful if the strategy and products are adopted and used by all relevant organisations from the Authority to catchment management organisations.

This business case sets out the measures needed to enhance environmental water delivery across the southern connected basin and enable a hydrological cues delivery strategy.

EEWD measure	
1	Development of water management capabilities, strategy and tools - Investigative work to understand, develop and trial the new delivery and operational environment and tools for river management under unregulated flow conditions. This task aims to improve the probability of releasing the minimum amount of water while maximizing the environmental benefit achieved.
2	Development of mechanisms and processes to provide real time and efficient water management decision making – work to develop/modify/change current water delivery administration and coordination mechanisms, processes and tools to allow real time water release decision making across multiple parties and jurisdictions, and so avoiding slow release decisions which are ineffective or utilize too much water.
3	Identification and removal of current water accounting limitations to efficient environmental water delivery across the southern connected basin – to ensure released environmental water is used multiple times through the river systems, and so reducing the total volume of environmental water required. Accounting rules also need to ensure there are no third party impacts on water supply operations and entitlements from hydro cues releases.
4	Establishment of a clear and enduring mandate for governments and river operators to order and deliver environmental water aligned with un-regulated flows, up to agreed constraints relaxation levels. Without it, ongoing uncertainty will delay and limit water release decisions and undermine the ability to achieve environmental targets or efficient water use.
5	Development and use of a monitoring and evaluation framework to assess the effectiveness of a hydrological cues delivery strategy to allow progressive learning and refinement – providing increasing water use efficiency achievement during the strategy trialing and subsequent ongoing operation.

## 2. Revised budget

The project requires a substantial amount of work to be undertaken in a relatively short timeframe. This involves much work being done in parallel, with information and outputs passing between tasks in different measures.

Costs have been estimated based on available information. Phase I of each measure (to be undertaken in 2017/18) will define the specific work program for each measure, and better define costs of individual tasks. A revised budget is provided at Attachment 1.

The initial budget included in the business case has been reviewed by MDBA and state agency staff and technical experts from DG consulting. It has been revised to be much clearer about the relevant tasks and associated costs and to build the budget based on tasks rather than FTEs as the original had done. This latter approach had led to confusion and was not reflective of the likely effort required as inputs will be required from a range of sources including expert contractors/consultants. Opportunities to streamline activities and reduce costs have also been taken on board. This has resulted in a reduced overall budget. References to in-kind costs which were incorrect and confusing have been removed.

It should also be noted that substantial in-kind resources from the MDBA and State agencies will be required to deliver this program (in the order of ██████████ per state and ██████████ MDBA). This reflects the links to broader environmental watering and it is acknowledged that some of the products

produced to support this project may have application more broadly. It is not possible to quantify and separate these 'flow on' benefits as they result from activities needed for EEWD and especially if the project is to be delivered in full by 2024.

### 3. Responses to Commonwealth questions

The Commonwealth is undertaking an assessment of the proposal and has identified the following business case issues.

1. The Commonwealth seeks to understand the justification for the [REDACTED] funds requested. The request is comprised largely of funding for approximately [REDACTED] (each for 3 years) in the form of a team of [REDACTED] over next seven years. This does not seem commensurate with the deliverables proposed for each of the EEWD measures in the work plan provided.
  - *The original budget did not propose to fund [REDACTED]. There was confusion between resources for the EEWD project and states indicating in-kind support.*
  - *In response to the Commonwealth's concerns the budget has been revised. The revision has been conducted by DG consulting working with the MDBA and state proponents. DG consulting have considerable experience in business case development and river management. See Attachment 1.*
  - *The revised budget outlines tasks, deliverables and costs in a much clearer and detailed manner. However there has not been time to make corresponding changes to chapter 5 to ensure consistency between the documents and deliverables. The revision does not alter the fundamentals in the business case rather it has defined activities and deliverables in more detail and more concretely.*
  - *As outlined in the project summary above and through the revised budget this is an extremely complex project that is, in effect, bringing forward what would be at least a 15-20 year work program into a 6.5 year delivery window. Significant extra expertise and resources will be required to achieve the implementation of the project to the level required in this time.*
2. The Commonwealth seeks to understand how each of the project elements is necessary to achieving a supply offset from piggy-backing environmental water (i.e. the hydro cues delivery approach) to coincide with natural increases in flow.
  - *The EEWD project consists of five interlinked and interdependent measures that, when combined deliver a significant supply offset. The individual measures are each a necessary component of the total project and hence the total offset. Each measure is aimed at addressing a different limitation of, the current system for delivery of environmental water.*
  - *The project summary provided above seeks to provide an overview of the complexity and challenges of the project.*
  - *Measure 1 builds the technical knowledge to enable delivery of regulated flows on top of unregulated flows, to address complementary, additional targeted water recovery and to enable the strategy to be integrated with other modes of environmental watering. Without the improvements to the administrative processes, accounting systems, and legal authority for delivering environmental water that are the outcomes from measures two, three and four, this knowledge would not be translated into effective environmental outcomes.*
  - *This project will be breaking new ground and as a result initial strategies and supporting tools will be developed and then trialed as part of project delivery through the adaptive*

*management processes established through the evaluation and monitoring program (measure 5). Without providing the framework to test the efficacy of the new processes, tools and knowledge, there will be little incentive to water holders and river operators to improve the new planning, decision making and operational approaches.*

- *All of the measures will need to be supported by effective program management and stakeholder and community engagement. As noted above this is a complex change management project that will require engagement and buy in from a wide range of water managers, holders and river operators across the states and MDBA including state water holders and catchment management organisations. It goes well beyond River Murray system management arrangements.*
  - *All supply measure projects provide an offset through the sum of their parts. While a clear line of sight cannot always be shown, for example, undertaking a cultural heritage impacts study for a works projects, each step in the process is necessary to achieving the ultimate supply offset associated with the project as a whole.*
3. The draft business case encompasses a list of organisational/administrative updates to overhaul outdated processes and overcome existing limitations, streamline disjointed processes or amend processes so they can cope with the volumes now held by environmental water holders. There is a question for the Commonwealth whether the majority of these activities are able to be funded from Commonwealth supply measures funding because:
- a) many do not appear to contribute to achieving a supply measure offset under the SDL adjustment mechanism;
  - b) they relate to the delivery of all environmental water – not just the supply adjustment volume that will be achieved from adopting a hydro cues delivery approach; and
  - c) these activities are the normal business of the entities that operate the river (states/MDBA).
- *All activities included in the business case are necessary to achieve the strategies, tools and administrative and governance arrangements needed to deliver the supply measure offset. If not undertaken the project will not be delivered to the level to enable the effects seen in the modelling or in a way that ensures adverse impacts are prevented and positive outcomes maximised.*
  - *For the constraints projects, the full potential of those measures will only be realised through the implementation of the EEWD project.*
  - *In developing the budget the inputs that are business as usual (BAU) have been identified and not included in the costing. This was the point in the original budget of highlighting state and MDBA in-kind and estimated in-kind over the period of the project is highlighted in the project summary above.*
  - *The EEWD project will expedite and coordinate the necessary improvements to enable the EEWD strategy to operate in a manner that is integrated with and complementary to other modes of environmental watering. All the activities are needed for EEWD and some may also have benefits for improving environmental watering more generally. Similarly other supply projects are likely to have broader benefits for general river operations and consumptive users as the environment.*
  - *A key issue here is that without the EEWD project there is no expectation that the existing processes will improve significantly over time, or where they do improve, that any*

*improvements to the processes will be coordinated across agencies, catchments and resource units. Broader changes to environmental watering would certainly not occur in the 6.5 years to deliver this project.*

4. Is the MDBA final modelling report (referenced on page 37) available?
  - *The latest reports were included in the notification (modelling report and further modelling note).*
  - *The final model report will not be completed until the final package has been run and will be made available to the Commonwealth for their consideration at that time.*
5. The Commonwealth understands that the EEWD proposal represents a 'changed' future hydrology regime, which would fit the "operating rule change" supply measure category. Further information is required to explain why the project is not primarily a rule change. Jurisdictions are aware the Commonwealth position is that rule changes will not be funded except to address third party impacts.
  - *The project summary and revised budget demonstrate that this is not a rule change project. Where there are rule changes that eventuate this has been identified as business as usual (BAU) and not included in the costs*
  - *For example, the project covers improved knowledge to develop the strategy, improved hydrology models and forecast tool , construction of new gauges to better manage and coordinate flows and correlate with ecological outcomes, improved data management systems and administrative frameworks, new water accounting system software (measure 3), new legal frameworks and operational strategies , research outputs, trials , evaluation and monitoring program to provide the understanding of environmental responses and demonstrate improvements to river ecosystems and to revise initial strategies and tools.*